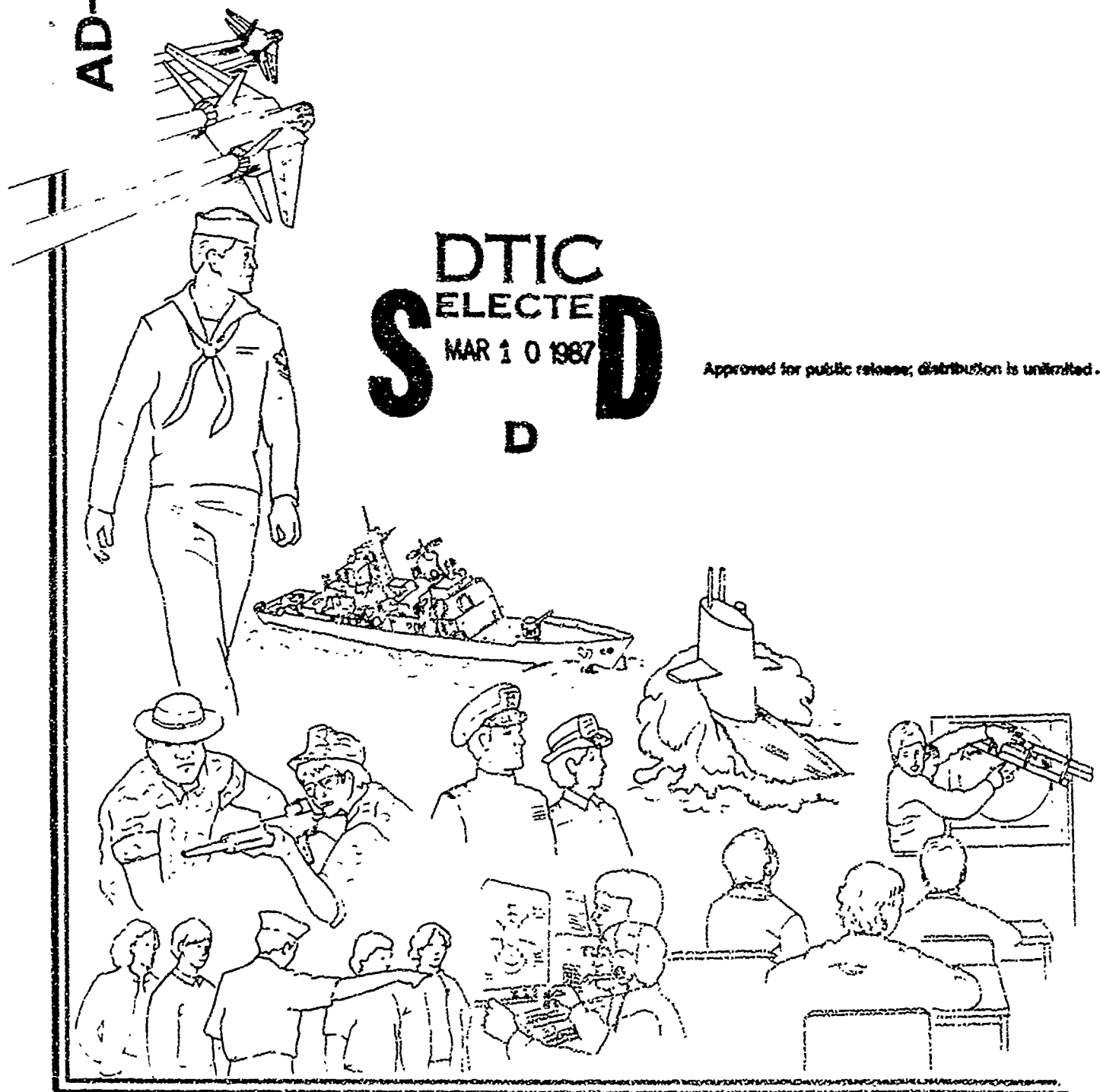




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Developing Performance Measures for the Navy Radioman (RM): Selecting Critical Tasks





DEPARTMENT OF THE NAVY
NAVY PERSONNEL RESEARCH AND DEVELOPMENT CENTER
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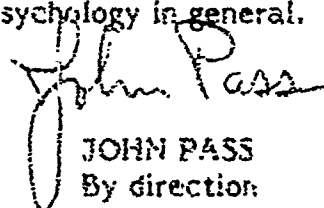
From: Commanding Officer, Navy Personnel Research and Development Center

Subj: **DEVELOPING PERFORMANCE MEASURES FOR THE NAVY RADIOMAN (RM):
SELECTING CRITICAL TASKS**

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1. The Navy Job Performance Measurement Program is an outcome of the Navy Performance-Based Personnel Classification Sub-project (Z17701.001). Both efforts constitute significant contributions to the Joint-Service Job Performance Measurement/Enlistment Standards Project. The Joint-Service Project has been mandated by Congress to link enlistment standards to job performance, which can be considered a landmark research thrust of the armed services. The present research has been funded primarily under Project Element Number 63707N (Manpower Control System Development) and Project Number Z1770 (Manpower and Personnel Development).

2. This report details the selection of critical tasks for a performance test for first-term incumbents of the radioman (RM) rating. The information it contains is intended to benefit the research and the operational RM communities. Ultimately, the outcome of the project will benefit the armed services, military and civilian research communities, and applied industrial organizational psychology in general.


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By direction

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**DEVELOPING PERFORMANCE MEASURES FOR THE NAVY RADIOMAN (RM):
SELECTING CRITICAL TASKS**

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<p>This report details the identification and selection of a set of critical tasks within the job of first-term Navy radiomen. The research reported herein is being conducted as a preliminary requirement for developing performance measures for the congressionally-mandated joint service job performance measurement/enlistment standards project.</p>				
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SUMMARY

Problem

The global problem addressed by this research is the development of measurement technology that can relate enlistment standards to actual job performance. Within that overall effort, it is necessary to develop performance measures for the Navy radioman (RM) rating.

Objective

The research detailed in this report identified a set of critical tasks within the job of a first-term Navy RM, as a preliminary requirement for developing performance measures.

Approach

Task identification and selection was accomplished in a two-phase approach that included job analysis, interview, questionnaire, card sort, data analysis, and the experience-based judgment of subject matter experts (SME) approaches. The research drew upon the judgments of both RM job incumbents and supervisory personnel. Reliability analyses and factor analyses were completed on questionnaire response data and on judgment-based task categorization data. Candidate tasks were recommended to a Quality Control Review Panel (QCRP), a group of specially selected Navy job experts cooperating in the research, which made the final task selection. Critical task identification and selection was guided by Guion's (1979) paradigm for reducing the job to a job sample.

Results

The research necessary to reduce the job to a job sample was accomplished. Data analyses revealed excellent reliabilities. The selected critical tasks form the basis for test items that will be developed for administration in the operational environment.

Conclusions

1. Critical tasks for first-term RMs were identified through a systematic procedure that included description of the job content universe and sampling from that universe. While there is some possibility that one or more tasks might prove infeasible for hands-on administration--and therefore require replacement--the final list of critical tasks represents a sound basis for item development.
2. This research attempted to operationalize assumptions about what should be included in the performance test and to use them in the job analysis and task selection. To a large extent, this effort was successful: The task selection was based on criteria meaningful for the purposes of measurements.
3. The procedures used to obtain the final job sample ensure that the tests will have high content validity. The QCRP reviewed work at each step in the process, assuring a high quality product. The QCRP procedure also established an audit trail, facilitating acceptance of the final test package by the commands whose representatives are on the panel. Data indicate that reliable judgments were obtained.

Recommendations

1. Accept the critical tasks identified in this research as a valid subset, or domain, of the test content universe for R.M.s.
2. Using the set of critical tasks identified here, proceed to develop the hands-on job sample test, the job knowledge simulation test, and the rating scales.
3. Consider applying the procedures for domain definition employed in this research to the development of performance measures for other Navy ratings.

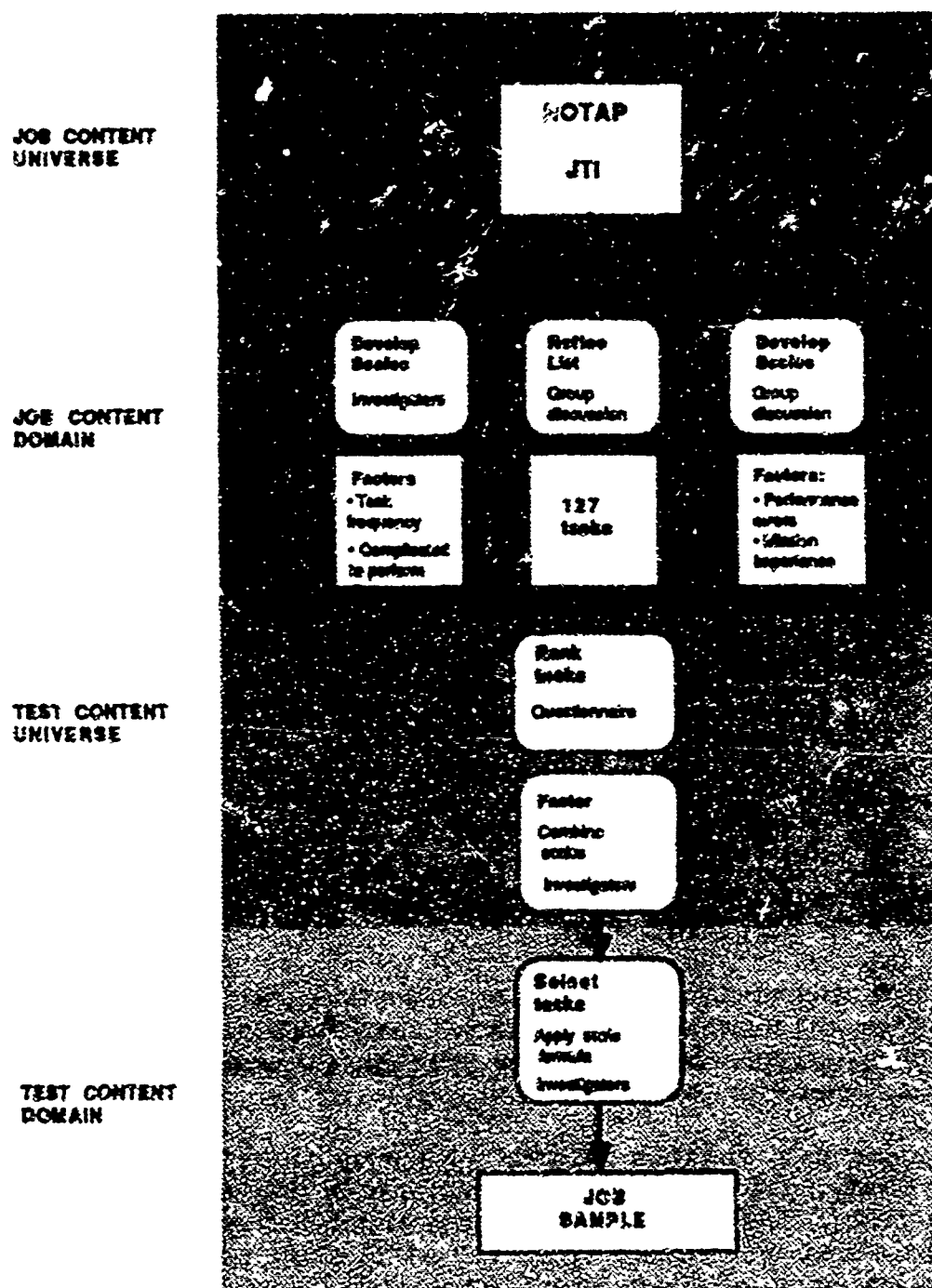


Figure 2 (see p. 4). Task identification and selection for testing the Navy radioman. The Joint Service Job Performance Measurement/Enlistment Standards Project will eventually link enlistment standards directly to job performance. Current standards are based on

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INTRODUCTION

Problem

In response to Congressional and Department of Defense (DoD) concerns, the services are investigating measurement approaches that might make personnel classification more performance based. A previous report (Laabs & Berry, in press) outlined the research strategy of the Joint-Service Job Performance Measurement/Enlistment Standards Project. Basically, that strategy is to construct hands-on performance measures and investigate their use for job performance predictor validation. A major research focus is the development of job sample tests that can be used as a high-fidelity benchmark against which surrogate, less expensive, measures will be compared.

The global problem is the development of measurement technologies accurate enough to relate enlistment standards to actual job performance. Within that overall effort, it is necessary to develop performance measures for the Navy radioman (RM) rating. Because (1) a major career point is reached by survival to the end of the first enlistment, and (2) the emphasis is on apprentice-level job performance prediction, the effort reported here focused on first-termers (i.e., job incumbents with 48 months or less service).

The RM rating was selected by the Navy for performance test development because (1) it is critical to mission success; (2) it has a large population, including substantial numbers of women and ethnic minorities; and (3) it is similar to RM jobs in the other armed services (Laabs, Baker, Kroeker, & Kidder, 1986). Under contract, a number of performance measures are being developed for this rating including (1) a hands-on job sample test, (2) a job knowledge simulation test, and (3) a set of rating scales.

Objective

The objective of the research detailed in this report was to identify a set of critical tasks subsumed within the job of a first-term Navy RM, as a preliminary to developing performance measures.

Background

A job performance measure is a sample of stimuli and behavior from a larger domain of job content, and the fidelity with which this sample represents the job content domain is a serious scientific issue (Brush & Schoenfeldt, 1982; Distefano, Preyer, & Erffmeyer, 1983; Guion, 1975). Thus, selecting an array of critical tasks is the first and perhaps most important step in test development. Unless performance measures are constructed on the basis of careful content sampling, a criterion-related validity study becomes an infinite regress argument (Ebel, 1956, 1977; Guion, 1977). Too often, the definition of the total job content and task sampling are haphazard processes in which the objectives for the resulting measure are never made explicit. This can result in measures of low utility.

In the present case, for the performance measures to be valid, they must adequately represent the important tasks done by first-term RMs. In fact, the validity of the entire test package to be developed—the hands-on job sample test, job knowledge simulation test, and the rating scales—depends on the adequacy of the methods used in identifying and selecting the behaviors to be tested.

Out of the many tasks done by RMs, a manageable subset must be selected as candidates for the hands-on test items. Test items will be critical job tasks that can feasibly be measured in the hands-on mode.

A Definition of "Critical"

There are a number of ways in which one might define "critical" for purposes of task selection. One might, for example, select the tasks that have the most dire consequences in the case of inadequate performance, or those that are performed most frequently, or those on which the largest volume of training resources is spent. In any case, the definition should, to a large extent, reflect the use of the information that will be gathered.

The current application of the data involves the development of different types of performance measures to ascertain which are the most feasible for use in a later, more encompassing, validation effort. One of the types of measures to be constructed is a job sample test, which involves sufficient expense and administrative steps to limit the number of tasks that may be tested. For that reason, a target of 15 tasks was established. This rather small number of tasks that can be tested makes even more important the careful selection of tasks, taking into account the users of the tests, the amount of information expected to be provided, and the individual duty assignments to be examined.

Examinee acceptance was essential. That is, it was important that the Navy RMs and the test scorers view the tests as valid measures of important parts of the job. Importance in this context includes: (1) performance by a sizeable number of RMs and (2) importance to mission success.

To evaluate performance measures, scientists need variance in task performance. Consequently, it is desirable to select tasks that are neither so hard nor so easy that little information is gained by measuring performance on them.

Finally, in light of the exigencies of Navy work, it was necessary to select tasks that cut across different types of Navy RM assignments, including ship, shore, large and small operational units, and so on.

The definition of "critical" that emerged may be summed up as follows: Critical tasks are those that are (1) performed by a sizeable number of incumbents, (2) important to mission success, (3) characterized by at least moderate performance variance, and (4) subsumed in a large number of Navy RM jobs that cut across varied duty assignments.

The Notion of Utility

Determining the job content domain necessarily involves tradeoffs. One such tradeoff is between two facets of representativeness identified by Fitzpatrick and Morrison (1971): fidelity and comprehensiveness. Fidelity is the realism with which individual domain elements are reproduced in the test. Comprehensiveness is the number of domain elements represented. The tradeoff between these two may be illustrated by hands-on measures, which produce maximal fidelity but are so expensive to develop and administer that they are generally limited in comprehensiveness.

When tradeoffs are involved, decisions must reflect utilities based on values assigned to different outcomes. Utility in testing has been largely confined to (1) predictors and (2) criterion-related methods. However, it should be remembered that utility, broadly defined, is the payoff the organization receives from a measurement effort, whether that effort results in a predictor that has been validated by a criterion-related method or a performance measure that has been constructed with content-oriented techniques. A number of factors may increase or decrease the utility of a performance test. Basing it

on tasks that are critical to organizational success tends to increase the utility, as would using the resources to measure performance on areas of the job that are not performed well by all incumbents. A successful-hurdles approach (i.e., an approach based on a particular sequence of events) to this problem can help ensure that the various utility considerations have received appropriate weight in the task selection process.

GENERAL APPROACH

Critical task identification and selection was accomplished by an approach that included job analysis, interview, questionnaire, card sort, data analysis, and the experience-based judgment of subject matter experts (SMEs). The research drew upon the judgments of both RMs and their supervisors. Candidate tasks were recommended to a Quality Control Review Panel (QCRP), a group of specially selected Navy job experts cooperating in the research, which made the final task selection.

Critical task identification and selection was guided by Guion's (1979) paradigm for reducing the job to a job sample. It includes four entities often confused or not clearly defined in discussions of content sampling methodology. A basic distinction in the model is made between a universe and a domain. A domain is generally a nonrandom sample from a universe (Figure 1). Guion's four major steps include determining the (1) job content universe, (2) job content domain, (3) test content universe, and (4) test content domain. Our research addressed these four steps in two phases, the first dealing with selecting job content and the second with selecting test content, as shown below.

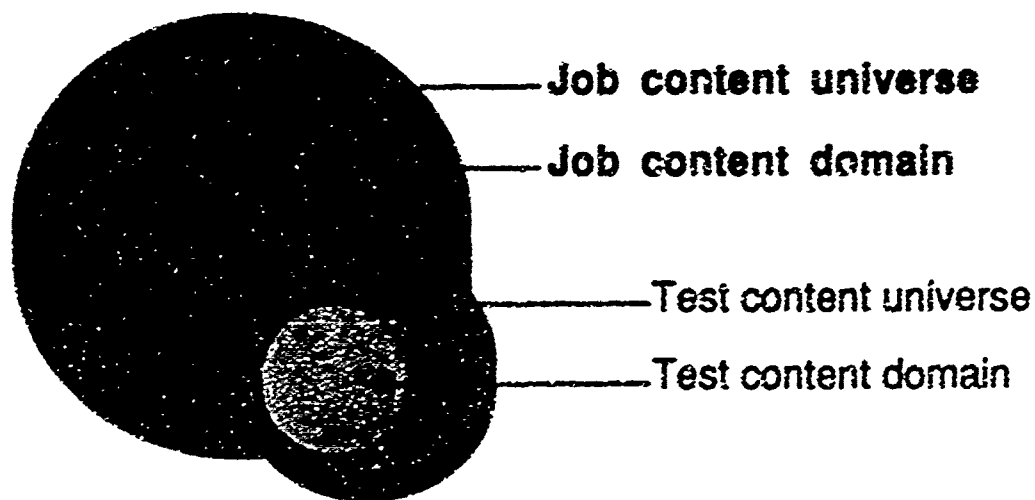


Figure 1. Venn diagrams relating job content to test content, labelled for Phase of Effort (adapted from Guion, 1979). Test content includes nonjob elements such as scoring procedures and rules for generating test stimuli and responses.

The critical tasks selected form the basis upon which the test items will be developed for administration in the operational environment. Figure 2 shows the steps we used to adapt Guion's (1979) schema. It shows the orderly reduction of job task information contained in the job content universe to the final set of 15 tasks selected for test development, indicating the major sources of information used in each step.

JOB CONTENT
UNIVERSE

JOB CONTENT
DOMAIN

TEST CONTENT
UNIVERSE

TEST CONTENT
DOMAIN

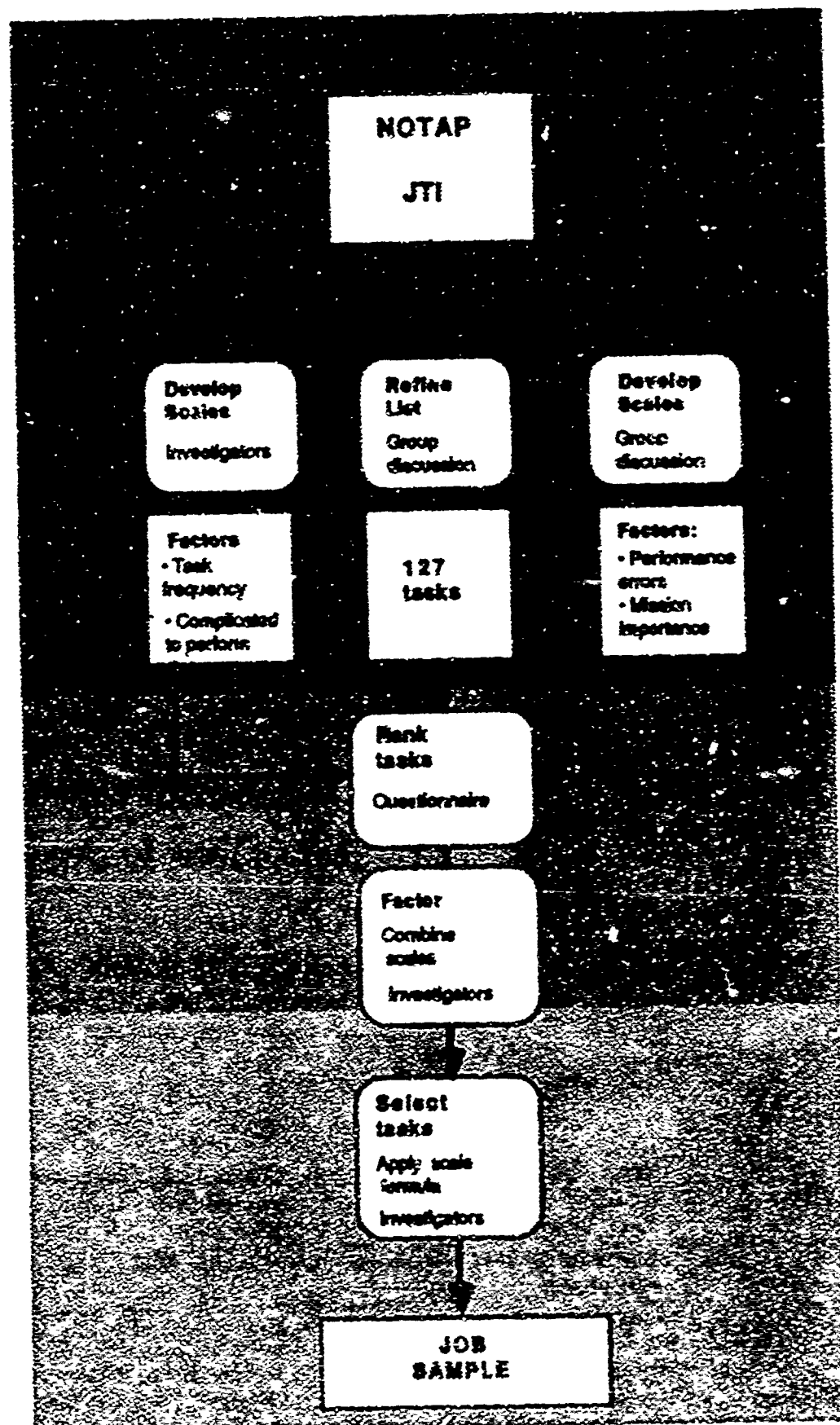


Figure 2. Task identification and selection.

PHASE ONE: SELECTING JOB CONTENT

Step 1: Defining the Job Content Universe

The first component of the Guion model is the job content universe, which consists of all the tasks, duties, and characteristics of the job. The constrained job content universe with which this effort was concerned is that of the first-term RM job, whether located ashore or at sea, at a large or small installation.

To develop the task list, the research staff began by reviewing job documentation such as previous job analyses, training materials, and so forth. The RM job content universe was defined by a comprehensive task analysis. Two major sources of information were used: data from the Navy Occupational Task Analysis Program (NOTAP), which is used to develop the RM occupational standards, and the Job Task Inventory (JTI), which is used in developing the entry-level training (i.e., "A" school) RM curriculum.

The two sources overlap considerably and contain 500-600 different task statements. Examples of tasks from each source are listed in Figure 3.

To supplement the information from these two sources, we interviewed first-term RMs and their supervisors, in which the major task areas of the job were defined and the component tasks of each task area were detailed. We augmented the interviews with job observation.

We wrote descriptions at a level of specificity that would facilitate feasible, meaningful units for hands-on testing. To ensure that all task statements were written at the same level of generality, subtasks were accumulated into more comprehensive tasks, while broader, more general tasks were separated into their constituent parts. The original list included well over 500 tasks that defined the job content universe.

Step 2: Determining the Job Content Domain

Next, the job content domain for first-term RMs was specified. The job content domain is a sample from the job content universe that has been chosen for testing according to some predetermined objective(s). In this case, only tasks in the technical proficiency domain were selected.

The joint-service research strategy addresses technical job proficiency only, specifically excluding purely military or routine administrative tasks, as well as other job performance considerations such as team tasks and motivational, situational, or stress factors. Since the purpose of the project is to construct measures tapping first-term RM specialty-specific performance, only those tasks performed uniquely by first-termers were of interest: Navy-wide tasks such as cleanup and damage control were not. The refinement process deleted Navy-wide tasks, as well as those not within the normal purview of first-termers.

Initial Task Selection

Method. The original list of task statements was refined and reduced through two workshops that included SMEs who were supervisors of first-term RMs. Both ship and shore installations were represented. Seven senior Navy enlisted personnel and one civilian attended the first workshop, which was held in San Diego. A second workshop, held at Norfolk, Virginia, in which seven senior Navy enlisted personnel participated, further shortened the task list.

ATION

Task Job Description	Cases 1977	Tasks 228	Duties 13	Members 175
----------------------	---------------	--------------	--------------	----------------

Task Title	N
Count of duties or tasks listed	%
Cumulative sum of average percent time spent by all members	%
Average percent time spent by all members	%
Average percent time spent by members performing.....	%
Ordered by percent of members performing.....	% ****

Task Title

W	2	Perform field day	80.57	7.12	5.73	5.73
C	10	Make copies of messages	73.14	6.94	5.07	10.80
B	10	Destroy classified material (shred, burn, pulp, etc.)	70.86	5.94	4.21	15.01
W	6	Stand inspections	70.28	4.77	3.35	18.36
C	11	Slot messages	68.00	7.14	4.85	23.22
W	1	Hold sweepdowns	68.00	5.32	3.62	26.84
E	18	Change teletype paper, tape, ribbons, etc.	66.28	5.01	3.32	30.16
W	7	Attend quarters	59.43	6.53	3.88	34.04
C	3	Stamp messages (routing indicator, classification, etc.)	56.57	5.80	3.28	37.32
C	8	Screen messages for accuracy and completeness	56.57	4.75	2.68	40.00
						10

iii

JTI:	Terminal Objectives (TO) No.	Learning Objectives (LO) No.	(*) Indicates Deletion from Curriculum (AUG 80)	MOD No. and Page No. Revised Curriculum (AUG 80)	Student Contact Hours (Revised Hrs.)
OPNAV Priority No. & Job Area	OPNAV Approved RM Apprentice Job/Tasks				
A3	D1-8	Format outgoing message for TTY entry - modified ACP 126.	Identify narrative and service messages TO-3; LOs 8-10	MOD 3, p. 17	.8
<u>Format/type messages</u>	D1-9	Format outgoing message for TTY entry - ACP 126	Identify special handling markings TO-3; LOs 3, 5A	MOD 4, p. 18	.7
	D1-15	Format outgoing message for delivery by scanner (LD14X)	Identify address designators TO-3; LO 19	MOD 5, p. 19	1.7

Figure 3. Examples of tasks from NOTAP and JTI sources.

Results. Through this refinement process, 124 task statements were initially selected. These were evaluated by the QCRP, which approved a final list of 127 task statements (the panel added 3 tasks to the original list). These tasks specifically address technical proficiency.

Identification of Job Categories

Method. To help later selection of test content, an additional, parallel step of categorizing the tasks along underlying job performance dimensions was required. Sampling from what will later become the test content domain along underlying dimensions ensures adequate job content representation. During this step, job categories were identified in a workshop setting.

In order to derive the job categories, a taxonomy of tasks was developed at a workshop attended by 12 senior staff personnel from the Navy's entry-level RM training course in San Diego.

Card decks were used to identify the job categories for stratified sampling of critical tasks. Each task was placed on one card. (At the time that this sorting task was done, the task list consisted of 132 statements, 8 of which were later deleted.) Thirteen RM job experts then sorted the cards into categories of the same type or that dealt with the same type of equipment. The instructions for this task, adapted from Berman, Toquam, and Rosse (1977), did not restrict the number of categories that could be used. The sort yielded the following categories: (1) preparing and processing messages/establishing communications, (2) setting up equipment, (3) maintaining equipment, and (4) handling secure materials.

To achieve a metric multidimensional scaling solution, the individual sortings were first cumulated into a 132 x 132 raw similarity matrix, with each cell s_{ij} representing the percentage of times that tasks i and j were placed in the same category by the 13 respondents. A mean interproduct matrix was then computed from these similarities using the following formula:

$$M_{ij} = \frac{\sum_{k=1}^{132} s_{ik} s_{jk}}{132}$$

This measure's advantage over the raw similarity measure is that it takes into account the patterns of similarity across all tasks. The factor analysis of similarity indices is described in Nunnally (1978) and Torgerson (1965).

This matrix of mean interproducts was then factored, and the factors were rotated using the varimax criterion. Tasks were assigned to factors using the highest loading, as the goal was to sample tasks from content areas. The number of factors to accept was based on an examination of the magnitudes of values in the factor structure matrix for each factor. The four factors accounted for 97 percent of the variance.

In forming the categories, we emphasized interpretation over strict adherence to the algorithm. The goal was to identify job categories only as broad guidelines for task selection; the ultimate task selections were to be made by job experts using, in part, the job analysis questionnaire data. The data analysis was thus used only as a tool to aid experts' interpretation of the job.

Results. An orthogonal four-factor solution was chosen based on interpretability and magnitudes of factor loadings, and the factors were interpreted by the items assigned to each. The names of the four factors and the numbers of tasks assigned to each are as follows: preparing and processing messages/establishing communications (69), setting up equipment (23), maintaining equipment (21), and handling secure materials (11). As an attempt to increase the interpretability of the results, other procedures for assigning tasks to factors were attempted (such as using all the factor loadings); however, this did not increase interpretability. Eight tasks were subsequently eliminated based on the QCRP recommendations, leaving 124.

PHASE 2: SELECTING TEST CONTENT

Step 3: Defining the Test Content Universe

The next step in the procedure is to identify the test content universe, which in addition to tasks, consists of rules for generating test stimuli and responses, scoring procedures, and conditions for measurement. Put simply, this universe embraces all tasks that could be included in a hands-on test, plus elements introduced by the testing situation.

The testing situation includes conditions imposed to achieve relatively standardized testing and the procedures used to observe and record responses. For the RM rating, the test content universe is essentially the same as the job content domain, defined by the 127 tasks identified in Phase 1, except for the addition of the testing conditions. These testing conditions will have to be specified after test item development and refined after the pilot test.

A way must be found to reduce the test content universe of 127 tasks to manageable proportions. Some priorities must be established to determine test content domain (i.e., task selection for test development). One of the typical methods to set task selection priorities is to gather information on the criticality of performing each task correctly and the frequency with which it is done. During this step a questionnaire was developed and administered to gather the information required to determine the test content domain in Step 4.

Method

Questionnaire development. The Navy conducted an extensive survey to gather judgments from personnel in the rating. The 127 task statements that define both the job content domain and the test content universe were incorporated in a questionnaire, the Radioman (RM) Survey Form, designed to isolate the critical first-term RM tasks.

The questionnaire was developed in two forms, both based on the same task list. One was for first-term RMs (those RMs with 4 or less years of active duty), and one for supervisors (RMs with between 4 and 10 years of active duty).

The scales and anchors were developed in discussions with job experts. The QCRP had proposed four judgment scales: (1) frequency of task performance by first-termers, (2) difficulty (complexity) of the task, (3) importance of the task to mission accomplishment, and (4) frequency of errors on the task by first-termers.

The questionnaire for first-term RMs (Appendix A) asked them, first, to check the tasks they perform and then, for each task checked, to rate (1) the frequency with which

it is performed and (2) the complexity of the task. All responses were made using the 5-point scales shown in Appendix A. The other questionnaire, for supervisors of first-term RMs (Appendix B), asked supervisors, first, to check those tasks performed by first-termers, and then, for each task checked, to rate (1) the importance of the task for mission success, and (2) the performance errors made, or the percentage of time that the task is performed incorrectly when it is done. The first rating scale for both questionnaires was designed to measure task importance, the second to measure task variance.

The questionnaires were designed for self-administration, with completely self-contained instructions. Random-response items were included to identify individuals not taking the questionnaire seriously.

The instructions and rating scales were refined based on two pretests with 20 RMs and supervisors. One major change was that the scales were changed to reflect absolute rather than relative judgments, with the review panel providing the scale values, or anchors. That is, judgment was made against an external scale with each level defined, rather than vis-a-vis other items, judgments, etc.

Questionnaire administration. The QCRP assisted in developing the sampling plan for distribution of the RM Survey forms. Panel consensus was that the jobs of first-term RMs probably differ, depending primarily on whether the job is in a large or a small communications facility. Other differences might occur depending on the job site: that is, ship or shore installation. Therefore, hull types and shore installation types were both dichotomized by the panel into large and small categories. The review panel asserted that there is no difference whatever in the RM's job between overseas and continental U.S. locations.

The questionnaire administration was designed using a proportional sampling plan based on the number of RMs and supervisors in each of four sampling cells defined by these distinctions: ship versus shore, and large versus small installation (for ship and shore). The large versus small installation comparison was of interest within both ship and shore groups.

Using the Enlisted Master Tape, the total number of RMs (both first-term and supervisor) assigned to each Navy facility categorized by the review panel was determined. Population totals in each of the four cells (made by crossing facility size and sea/shore location) were used to determine the number of questionnaires to be mailed. (Submarines were excluded from the selection process to minimize adverse impact on operations.)

The proportion of personnel who performed the tasks was the most widely varying aspect revealed in the data collection. Because of this, the simple random sampling formula for binomial data (with correction for finite populations) was applied to each cell. This ensured an adequate sample for each of the four potential job subtypes, should separate tests later prove necessary; that is, if a common core test cannot be achieved.

Because each cell includes a number of different types of ship or shore installations, the sample was drawn proportionally within each cell according to installation type. The PQ split (where P = probability of endorsement of a response, and Q = probability of nonendorsement of that response) used in the sampling formula was worst case (i.e., .5), the level of tolerance was .10, and the probability level set at .95. Thus, the number of personnel surveyed in each cell was determined by the formula:

$$N = \frac{N'}{1 + N'/\text{Population}}$$

The final questionnaire was sent to approximately 500 first-term RMs and 500 supervisors throughout the world. To facilitate timely return of the questionnaires, personnel assigned to ships that were deployed, on overseas cruises, or in overhaul status were eliminated. Except for this restriction and the exclusion of submarines, sampling was random.

The questionnaires were addressed to individuals by name and delivered via their commanding officer, along with a letter summarizing the purpose of the project and explaining that their response was important. Receiving commands were provided with an envelope for returning the questionnaires to research staff.

Results

Table 1 presents the number of job analysis questionnaires sent, returned, and deemed useable by the screening for response integrity (whether the questions were taken seriously). The mean return rate across sampling cells was 77.50 (range 73-84), but the mean useable return rate after screening was 52.75 (range 46-62). While no obvious differences could be discerned between those who did return useable questionnaires and those who did not, the rather low number of useable questionnaires should be noted.

Table 1

Sampling Information and Return Rates for Job Analysis Questionnaires

Group	Sent	Returned	Useable	Percent Returned and Useable
First-term RM				
Shore				
Large	140	117	69	49
Small	120	91	55	46
Ship				
Large	137	109	77	56
Small	142	105	88	62
Supervisors				
Shore				
Large	138	112	72	52
Small	119	92	59	50
Ship				
Large	114	85	52	46
Small	132	97	81	61

The first step in data analysis was the response integrity check on all questionnaires to screen out those with questionable response patterns. Intraclass correlations were calculated within sampling cells to assess the reliabilities of the questionnaire responses. The following were computed for each task: percentage performing (incumbents) or supervising (supervisors), both overall and within sampling cells; and mean values on all response scales, both overall and within sampling cells. To assess variability between sampling cells, point biserial correlations were computed for differences between ship and shore, large ship and small ship, and large shore and small shore.

The percentages performing or supervising and the mean values on the response scales from the job analysis questionnaire, both overall and within sampling cells, were to be used in critical task selection. Since critical task selection is made relative to a number of possible criteria, specific rules were not established prior to examining the data. However, the following served as guidelines: (1) Tasks should be performed by a large percentage of the job incumbents, (2) critical tasks should be among the most important and frequent as viewed by questionnaire respondents, and (3) tasks should be intermediate in difficulty such that they are neither too difficult nor too easy for the typical incumbent. It was the intent to apply these rules for both the overall sample and within each sampling cell; thus, the goal was to select tasks meeting the above criteria in all sampling cells. Selecting in this way, if the data permit, produces a set of critical tasks with maximum utility to the Navy.

Reliability. Intraclass correlations were computed on the importance and frequency scale responses to assess reliability. On these scales, when a task is not performed or supervised, a "0" rating may be assumed; and there is thus no missing data (ratings were made only for tasks performed or supervised). This is not the case for performance errors and for complexity: A "0" cannot be assumed if the task is not checked as performed or supervised. As a result of this difficulty, reliability analyses were not conducted on these two latter scales.

Intraclass correlations, for both single raters and composites (corrected with the Spearman-Brown formula), are shown in Table 2. The means for each cell on each task were used as the decision-making unit for critical task selection. All reliability estimates were quite high, indicating that the composites on which critical tasks were selected are quite stable.

Table 2
Mean Reliability Estimates for Job Analysis Questionnaires

Ship Size	First-term RM		Supervisors	
	Shore	Ship	Shore	Ship
Large	.96	.94	.97	.96
Small	.97	.94	.97	.95

Note: Cell entries are intraclass correlations corrected with Spearman-Brown formula.

Step 4: Determining the Test Content Domain

The test content domain consists of the actual selection of measures from the test content universe. This is the selection of the job sample. The method for determining the domain will incorporate decision rules, concurrence of the QCRP, and the logistical tasks associated with field data collection and analyses. The results, and the consequent achievement of this fourth and final step in Guion's (1979) paradigm, will be accomplished through the development of hands-on test items for the operational environment. The job sample has been selected, and test development is underway.

The decision rules that would select the best set of tasks were formulated by analyzing the questionnaire data by the procedures outlined above and examining percentages performing or supervising and the rating scale means. These values varied considerably between job categories; the means and standard deviations of task means from each category are summarized in Table 3 according to the questionnaire ratings. There are two significant implications about these data: First, the job categories captured meaningful differences in performance patterns for different parts of the job and hence have some utility for representative sampling of critical tasks. Second, because of for the large/small and ship/shore categories, different decision criteria for critical task selection will have to be applied in each category. Though the same basic steps could be followed for each category, the criteria at each step may have to be different to select the target number of tasks.

Method

The decision sequence for task selection was based on the following assumptions: (1) Moving from general (sample-wide) information to more specific (within cells) information would produce the most generalizable set of tasks; (2) supervisors' judgments are more valuable than those of first-term RMs, so percentage supervising, importance, and performance-error values should generally be given weight over percentage performing, frequency, and complexity; and (3) the best determinants, in order of criticality, are importance and frequency, percentages performing and supervising, and performance errors and complexity.

As noted above, the technical proficiency task list was drawn from several sources. To sample critical tasks representatively from different areas of the job, a target number of tasks to be selected from each job category (large/small and ship/shore) was determined. This was based on the numbers of tasks assigned to each category in the factor analysis. These targets were proportional to the number assigned; for example, if 50 percent of the tasks were assigned to Job Category I, we planned to select 50 percent of the tasks from that category if the data would permit that number. These targets were to be considered guidelines, not quotas, as the data might suggest fewer tasks for some categories and more for others. The goal was a set of critical tasks without sacrificing the criticality of individual elements for the representativeness of the entire set.

The strategy employed was a multiple, or successive, hurdles exercise. Figure 4 summarizes the procedure.

A concrete example of these rules in application is shown in Appendix C, which outlines the decision steps for choosing the eight tasks from Job Category 1. The primary rank ordering of tasks was done on the basis of overall criticality means, which reflect that the most general information for that scale is based on supervisors' judgments and incorporate the best determinants of criticality. Decision steps then proceeded to more specific information, information from incumbents, and the other indicators of task criticality.

Table 3
Summary of Job Analysis Questionnaire Data by Job Category

Item	Job Category			
	1 Preparing and processing messages/est. communications	2 Setting up equipment	3 Maintaining equipment	4 Handling secure materials
Number of Job Tasks	69	23	21	11
Percentage Performing				
Mean	44	25	19.5	40.2
Standard Deviation	21.1	14.1	18.9	11.6
Percentage Supervising				
Mean	48	34	27.2	50.9
Standard Deviation	20.1	18.8	19.2	11.4
Importance (Supervisors)				
Mean	3.25	3.48	3.38	4.43
Standard Deviation	.49	.49	.35	.33
Frequency (Incumbents)				
Mean	3.39	2.55	2.19	2.99
Standard Deviation	.66	.59	.47	.58
Perf. Errors (Supervisors)				
Mean	1.54	1.74	1.32	1.12
Standard Deviation	.24	.22	.14	.04
Complexity (Incumbents)				
Mean	1.73	2.03	1.87	1.67
Standard Deviation	.26	.22	.24	.14

1. Select tasks with the most critical ratings overall
2. Discard tasks that:
 - a. have a low performance frequency
 - b. are performed by a low percentage of the sampling populations
 - c. have a low percentage of performance errors
 - d. are characterized as low complexity
3. Ensure proportional representation by category

Figure 4. Successive hurdles for final task selection.

Results

Using basically this same sequence of applying job descriptors but varying the cutoffs as appropriate, given category differences, 13 tasks were designated as primary recommendations for selection and 9 as secondary recommendations. The distribution of tasks across categories is shown in Table 4. It is clear from that table that few of the tasks in Categories 2 and 3 merited consideration as critical.

Table 4
Preliminary and Final Critical Task Selection by Job Category

Job Category	Preliminary		Final Selected Tasks
	Primary	Secondary	
1. Preparing and processing messages/establishing communications	8	7	14
2. Setting up equipment	3	0	4
3. Maintaining equipment	1	0	3
4. Handling secure materials	1	2	3

Ultimately, 22 tasks were selected as critical. This set consisted of most of the original 22 primary and secondary tasks, with the exception that 3 tasks were dropped and 3 not in the initial set were added. The added tasks reflected operational requirements that are to be more heavily emphasized in the future by the Navy. The distribution of selected tasks across job selected is also shown in Table 4. The selected tasks are listed in Appendix D.

Expert Judgment

The final responsibility for critical task selection was given to a review committee of Navy job experts. The primary and secondary task recommendations, along with supporting data, were supplied to the committee. The committee made its selections based not only upon the data, but upon feasibility of testing, operational requirements, availability of equipment, testing time, and so forth.

To assist the QCRP in this process, preliminary task selections were made using the job analysis data. An overall target of 15 critical tasks was set; however, the final number depended upon the outcomes of the data analysis. Previous experience with hands-on testing in other Navy ratings indicated that 15 was a feasible and sufficient number of tasks. Job experts received both primary and secondary task recommendations (the secondary group was somewhat less preferred based on the data alone). Based on the assignment of tasks to job categories, the following targets were determined for appointment of the 15 critical tasks across the four categories: From Category 1, eight tasks would be selected, three tasks would be selected from both Categories 2 and 3, and one task would be selected from Category 4.

The decision criteria were flexible only up to a certain point. It would not be prudent to select tasks to fill a category quota if an insufficient number of tasks in that category failed to meet reasonable criteria of criticality. For example, if only one task in a category was performed by a sizeable number of first-term RMs and was further the only one rated as especially critical, frequent, and so forth, that task should be the only one selected from that category.

Note that the 15 tasks are included in those shown in Table 4. The final set of tasks was based on a melding of data and expert judgment. The QCRP carefully scrutinized the list of candidate tasks and, based on their accumulated experience in the Fleet, made recommendations for or against each test item.

The final task set that emerged was based on consideration of such interactive complexities as time constraints, impact on operational conditions, equipment requirements, feasibility for hands-on testing, and the intratest compatibility and sequencing of items. Tasks were chosen based on coverage for the category, representativeness of actual first-term RM duties, and feasibility for testing. Several tasks were also put in logical sequence by QCRP. An important consideration will be the question of exactly what equipment is to be used for on-site data collection. The actual hands-on test will be administered using the Communications Team Trainer, which duplicates a "radio shack" and uses actual equipment.

By adding a number of tasks, then carefully sequencing and timing the tasks, the QCRP arrived at a set of items that are testable on current inventory equipment, should not prove inordinately long in administration, and provide very realistic job coverage for the first-term RM. The final list of 22 tasks is contained in Appendix D.

CONCLUSIONS

1. The critical tasks for first-term RMs were identified through a systematic procedure that included thorough description of the job content universe and sampling from that universe. While there is some possibility that one or more tasks might prove infeasible for

hands-on administration—and therefore require replacement—the final list of 22 critical tasks developed in this effort represents a sound basis for item development.

2. This research attempted to make explicit the assumptions about what should be included in the performance measures and to operationalize them in the job analysis and task selection. To a large extent, this effort was successful, as the task selection was based on operationally meaningful criteria relevant to the purposes of measurement.

3. The procedures for obtaining the final job sample ensure that the tests will have the high content validity. The QCRP's expert review of work at each step assures a high-quality product. In addition, the QCRP procedure established an audit trail, facilitating acceptance of the final test package by the commands whose representatives are on the panel. Data indicate that reliable judgments were obtained.

4. The job analysis procedure used in this content sampling appears to be generalizable enough to be useful with a variety of different Navy ratings.

RECOMMENDATIONS

1. Accept the critical tasks identified in this research as representing a valid subset of the test content universe.

2. Using the set of critical tasks identified here, proceed with the development of the hands-on job sample test, the job knowledge simulation test, and the rating scales.

3. Consider applying the procedures for domain definition employed in this research to the development of performance measures for other Navy ratings.

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APPENDIX A

**NAVY RADIOMAN JOB DESCRIPTION QUESTIONNAIRE
FOR FIRST-TERM RADIOMEN**

**NAVY RADIOMAN
JOB DESCRIPTION QUESTIONNAIRE**

(FORM A: To be filled out only by first-term Radiomen)

Developed by:

Human Resources Research Organization
27857 Berwick Drive
Carmel, CA 93923

and

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INTRODUCTION

The Navy is conducting a project to find the best ways to measure the job performance of first-term Radiomen in the Navy. This questionnaire is an early step in that project. Its purpose is to learn more about the first-term Radioman job from those who know it best--first-term Radiomen and their supervisors.

Please take the time necessary to carefully consider each item and answer it to the best of your knowledge. We appreciate your help.

PRIVACY ACT NOTICE

Under the authority of 5 USC 301 judgments concerning the job performance of first-term Radiomen are requested for a research project on performance assessment. THIS INFORMATION PROVIDED WILL NOT BECOME PART OF YOUR OFFICIAL RECORD, NOR WILL IT BE USED TO MAKE DECISIONS ABOUT YOU WHICH WILL AFFECT YOUR CAREER IN ANY WAY. It will be used by the Navy Personnel Research and Development Center for statistical purposes only. Return of the questionnaire constitutes acknowledgment of these Privacy Act provisions.

This questionnaire has been assigned Report Control Symbol OPNAV 5312-5(OT), which expires 30 June 1985.

GENERAL INFORMATION

Please print your answers in the spaces provided or, where applicable, place a check mark in the one blank that best applies to you.

1. Name: _____

2. Social Security Number: _____

3. Complete Work Mailing Address:

4. What is your current pay grade?

- ☐ E-2
☐ E-3
☐ E-4
☐ E-5
☐ Other (please specify: _____)

5. How long have you been in the Navy?

- ☐ Less than 6 months
☐ 6 months to 1 year
☐ 1 year to 18 months (1 1/2 years)
☐ 18 months to 2 years
☐ 2 years to 30 months (2 1/2 years)
☐ 30 months to 3 years
☐ 3 years to 42 months (3 1/2 years)
☐ 42 months to 4 years
☐ 4 years or more

6. What is your current assignment?

- ☐ Ship
☐ Shore installation

If your current assignment is on ship, enter the ship type and hull number (e.g., CVN68, FF1083): _____

Go on to the next page

If your current assignment is on shore, check the type below:

- ☐ General Duty
- ☐ NAVCAMS (also check one of the following:)
 - ☐ Fleet Center
 - ☐ Tech Control Facility (including SATCOM)
 - ☐ Message Center/Data Base/Computer Deck
- ☐ NAVCOMSTA (also check one of the following:)
 - ☐ Fleet Center
 - ☐ Tech Control Facility (including SATCOM)
 - ☐ Message Center/Data Base/Computer Deck
- ☐ Receiver Site
- ☐ Transmitter Site
- ☐ NTCC
- ☐ Other (please specify: _____)

7. How long have you been in your current assignment?

- ☐ Less than 3 months
- ☐ 3 months to 6 months
- ☐ 6 months to 9 months
- ☐ 9 months to 1 year
- ☐ More than 1 year

Go on to the next page

INFORMATION ABOUT JOB TASKS

This section contains a list of first-term Radioman job tasks. The task list was developed by examining job descriptions, talking with Radiomen and their supervisors, and observing first-term Radiomen on the job. This list covers all first-term Radioman jobs at all installations, so it may contain some tasks that you do not do on your job.

In this section, you will answer three questions about these tasks:

- Is each task part of your current job? For each that is...
- How frequently is it performed?
- How complicated is it to perform?

As you fill in the questionnaire, consider only the work you do in your current job assignment. Do not consider tasks you performed in previous assignments.

PART OF CURRENT JOB Judgment

Read the first task and decide whether it is part of your current job. If the task is a part of your current job, place a check mark next to the task in the column labeled "PART OF CURRENT JOB". If the task is not a part of your current job, go on to the next task without placing anything in the PART OF CURRENT JOB column.

Go through the entire list of tasks in this way. **DO NOT FILL IN ANY OF THE OTHER COLUMNS UNTIL YOU HAVE GONE THROUGH THE ENTIRE TASK LIST AND INDICATED WHICH TASKS ARE A PART OF YOUR CURRENT JOB.**

Example

Following is an example of how one first-term Radioman indicated which of three sample tasks are part of his/her current job.

	✓ W PART OF CURRENT JOB	FREQUENCY <small>On the average, how often do you perform this task?</small> 1 - NEVER (less than once/month) 2 - OCCASIONALLY (about once/week) 3 - FREQUENTLY (2-4 times/week) 4 - OFTEN (about monthly) 5 - VERY OFTEN (more than once/month)	COMPLEXITY OF TASK <small>How complicated is this task to perform correctly?</small> 1 - NOT COMPLEX 2 - SIMPLE 3 - MODERATE COMPLEXITY 4 - COMPLEX 5 - VERY COMPLEX
1. Encode/decode call signs.	✓		
2. Rig emergency antennas.			
3. Stop messages.	✓		

This Radioman went through all the tasks and indicated which ones are a part of his/her job. Because Tasks A and C are part of the job, a check mark was placed by each of those tasks in the PART OF CURRENT JOB column. Task B, "Rig emergency antennas," is not part of this Radioman's job so he/she did not place a check mark in the PART OF CURRENT JOB column by Task B.

This Radioman correctly made the PART OF CURRENT JOB judgment for all the tasks on the list before going on to make any other ratings.

FREQUENCY and COMPLICATED TO PERFORM Ratings

When you have finished indicating which tasks are part of your current job, go back to the beginning of the list and complete the FREQUENCY and COMPLICATED TO PERFORM ratings only for those tasks that you previously indicated to be PART OF CURRENT JOB.

The FREQUENCY and COMPLICATED TO PERFORM ratings are to be made by filling in the one appropriate rating for each. A different rating scale is used for each of these ratings.

FREQUENCY Rating

For the FREQUENCY rating, indicate how many times you perform the task per week or day, on the average. Use the following rating scale to rate FREQUENCY:

- 1 - SELDOM (Less than once per week)
- 2 - OCCASIONALLY (About once per week)
- 3 - SOMEWHAT OFTEN (2-6 times per week)
- 4 - OFTEN (About once per day)
- 5 - VERY OFTEN (More than once per day)

For each task that you checked as PART OF CURRENT JOB, enter the one rating (1 to 5) that best describes how many times per week or day the task is performed.

COMPLICATED TO PERFORM Rating

For the COMPLICATED TO PERFORM rating, indicate how complicated the task is in terms of the knowledge and skill required to perform it correctly. Use the rating scale that begins on the next page for the COMPLICATED TO PERFORM rating.

- 1 - VERY SIMPLE
- 2 - SIMPLE
- 3 - SOMEWHAT COMPLICATED
- 4 - COMPLICATED
- 5 - VERY COMPLICATED

For each task that you previously checked as PART OF CURRENT JOB, enter the one rating (1 to 5) that best describes how complicated the task is in terms of the knowledge and skill required to perform it correctly.

Example

After checking all of the tasks that are a part of his/her job, this Radioman made the FREQUENCY and COMPLICATED TO PERFORM ratings only for those tasks that had been checked.

	✓ IF PART OF CURRENT JOB	FREQUENCY On the average, how often do you perform this task? 1 - SELDOM (Less than once/week) 2 - OCCASIONALLY (About once/week) 3 - FREQUENTLY (2-4 times/week) 4 - OFTEN (About once/day) 5 - MOST OFTEN (More than once/day)	COMPLICATED TO PERFORM How complicated is this task to perform correctly? 1 - VERY SIMPLE 2 - SIMPLE 3 - SOMEWHAT COMPLICATED 4 - COMPLICATED 5 - VERY COMPLICATED
1. Encode/decode call signs.	✓	2	3
2. Rig emergency antennas.			
3. Slot messages.	✓	3	2

Task A: This Radioman encodes/decodes call signs occasionally; about once per week. Thus, a "2" was written in for FREQUENCY. In terms of how complicated the task is to perform correctly, this Radioman believed that it is somewhat complicated, so he/she assigned a COMPLICATED TO PERFORM rating of "3" to the task.

Task B: This task was not checked as PART OF CURRENT JOB. Therefore, the Radioman did not fill in the FREQUENCY and COMPLICATED TO PERFORM ratings.

Task C: "Slotting messages" is performed somewhat often; about 2 to 6 times per week, so this Radioman assigned a FREQUENCY rating of "3". The task was considered to be simple in terms of the knowledge and skill required to perform it correctly, so a "2" was written in for COMPLICATED TO PERFORM.

Go on to the next page and begin the questionnaire.

	✓ IF PART OF CURRENT JOB	<u>FREQUENCY</u> On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-5 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	<u>COMPLICATED TO PERFORM</u> How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
1. Set up LF transmitters.			
2. Set up HF transmitters.			
3. Set up VHF transmitters.			
4. Set up LF receivers.			
5. Set up HF receivers.			
6. Set up VHF receivers.			
7. Set up UHF transceivers.			
8. Set up VHF transceivers.			
9. Set up satellite transceivers.			
10. Set up the SSR-1 satellite receiver.			
11. Set up antenna couplers/multicouplers.			
12. Set up crypto equipment.			
13. Set up teletypes.			
14. Change paper/ribbons on teletypes and printers.			
15. Patch communications equipment pieces together.			
16. Raise/lower antennas.			
17. Assemble/disassemble antennas.			
18. Plot ship positions for antenna assignments.			
19. Load program tapes in magnetic tape reader.			
20. Load program tapes in paper tape reader.			
21. Perform late starts on crypto equipment.			
22. Check frequencies for usability.			
23. Use chirp sounder to determine frequencies.			

	<p>✓ IF PART OF CURRENT JOB</p>	<p>FREQUENCY</p> <p>On the average, how often do you perform this task?</p> <p>1 = RARELY (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-6 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)</p>	<p>COMPLICATED OR EASY?</p> <p>How complicated is this task to perform normally?</p> <p>1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED</p>
24. This item is for keypunch purposes only. Do not write ratings for this one.			
25. Conduct radio checks (secure/nonsecure).			
26. Conduct quality control tests on transmit frequencies.			
27. Read journal (or channel) log teletypes to determine system status.			
28. Maintain communications status board.			
29. Pull messages from teletype or printer.			
30. Screen incoming messages for relevance, precedence, security classification, etc.			
31. Operate reperforator.			
32. Maintain listening watch on radiotelephone/voice circuits (e.g., Harbor Common, HICOM) and determine when call sign is received.			
33. Receive radiotelephone/voice circuit messages and transcribe to hard copy.			
34. Log entries in the Radiotelephone Log.			
35. Recognize and properly comply with special message handling procedures ("personal for", limited distribution, high precedence, etc.).			
36. Monitor channel number continuity for message traffic.			
37. Draft broadcast screen requests as appropriate.			
38. Log incoming messages.			
39. Log messages in General Message Log.			
40. Reproduce messages on photocopier and verify copy quality.			

	✓ IF PAGE OF CURRENT JOB	<u>FREQUENCY</u> On the average, how often do you perform this task? 1 = NEVER (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = FREQUENTLY (2-4 times/week) 4 = DAILY (About once/day) 5 = VERY OFTEN (More than once/day)	<u>COMPLICATED IN PERFORMING</u> How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
41. Use routing guide to determine distribution or routing of incoming messages.			
42. Use Standard Subject Identification Codes (SSIC) Manual to correct the internal distribution of messages on the Video Display Terminal (VDT).			
43. Manually route messages to appropriate destinations (e.g., a/c messages, post on read board, etc.).			
44. Verify outgoing rough drafts for completeness, accuracy, format, and releasing signature.			
45. Process DD-1392 Forms (data pattern message release forms).			
46. Log outgoing messages.			
47. Enter OCR Forms into Optical Character Reader (OCR).			
48. Use Video Display Terminal (VDT) to troubleshoot and correct OCR Forms that have been rejected.			
49. Remove OCR Forms from Optical Character Reader (OCR) and record Processing Signal Numbers (PSNs) and times of transmission.			
50. Prioritize outgoing messages according to precedence and time of receipt.			
51. Verify smooth messages with supervisor/releasing officers prior to transmission.			
52. Proofread outgoing messages prior to transmission.			
53. Record time of delivery and service cross on messages.			

	✓ IF PART OF CURRENT JOB	FREQUENCY On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = FREQUENTLY OFTEN (2-3 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	COMPLEXITY OF TASK How complicated is the task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
54. Process commercial message traffic (perform word counts, determine costs, accept funds, etc.) and maintain associated files/reports.			
55. Close out/commence all radio circuit logs at change of radio day.			
56. Prepare/transmit ZIC/ZIO reports.			
57. Maintain communications center message files.			
58. Maintain general message files.			
59. Maintain broadcast files/logs.			
60. Maintain message magnetic tape files.			
61. Select/use relevant general communications publications, instructions, and directions.			
62. Make corrections to and page check communications publications.			
63. Inventory general communications publications.			
64. Type/format/edit messages on teletype.			
65. Type/format/edit messages on Video Display Terminal (VDT).			
66. Determine appropriate format for outgoing messages.			
67. Type messages using ACP-126 format.			
68. Type messages using ACP-126 Modified format.			
69. Type messages using JARAP 126 format.			
70. Type messages using ACP-127 (RATG) format.			
71. Type messages using Naval Correspondence (Letter, memo) format.			

	✓ IF PART OF CURRENT JOB	FREQUENCY On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-4 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	COMPLICATED TO PERFORM How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
72. Type and format messages for Optical Character Reader (OCR) using typewriter.			
73. Load paper tape messages into Video Display Terminal (VDT) for editing.			
74. Select and change to appropriate mode on VDT (query, raster, service, etc.).			
75. Initialize CUDIX links using command teletype or terminal.			
76. Establish/maintain communications on ship-shore, ship-ship, or termination circuits.			
77. Initiate/respond to challenge and reply procedure on radiotelephone circuits.			
78. Initiate transmission authentication procedures.			
79. Establish/maintain communications on task group ORESTES.			
80. Enter commands on VDT to establish VFCT circuit configurations and channelizations.			
81. Coordinate communications using pony loops or order wires.			
82. Operate air preheater controls.			
83. Transmit messages via VDT terminal.			
84. Transmit paper tape messages using high-speed tape reader and command teletype (CUDIX system).			
85. Transmit messages via radioteletype.			
86. Transmit messages via radiotelephone/voice circuit.			
87. Encode/decode radio frequencies, short sentences, and voice call signs using appropriate publications.			

	✓ IF PART OF CURRENT JOB	<u>FREQUENCY</u> On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-4 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	<u>COMPLICATED TO PERFORM</u> How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
88. Receive confidential materials (excluding CMS).			
89. Inventory confidential materials (excluding CMS).			
90. Route confidential materials (excluding CMS) to appropriate personnel.			
91. Store confidential materials (excluding CMS).			
92. Destroy confidential materials (excluding CMS).			
93. Receive secret materials (excluding CMS).			
94. Inventory secret materials (excluding CMS).			
95. Store secret materials (excluding CMS).			
96. Route secret materials (excluding CMS) to appropriate personnel.			
97. Destroy secret materials (excluding CMS).			
98. Receive top secret materials (excluding CMS).			
99. Witness destruction of top secret materials (excluding CMS).			
100. Witness the receipt of CMS materials.			
101. Witness the inventory of CMS materials.			
102. Witness the control of CMS materials.			
103. Witness the storing of CMS materials.			
104. Store CMS materials.			
105. Witness the destruction of CMS materials.			
106. Check message recipients' identification and security clearance to ensure proper classification for level of traffic being picked up.			

	✓ IF PART OF CURRENT JOB	<u>FREQUENCY</u> On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-6 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	<u>COMPLICATED TO PERFORM</u> How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
107. This item is for keypunch purposes only. Do not write ratings for this one.			
108. Perform preventive maintenance on receivers (using Maintenance Record Cards, or MRCs).			
109. Perform preventive maintenance on transceivers (using MRCs).			
110. Perform preventive maintenance on transmitters (using MRCs).			
111. Perform preventive maintenance on antennas (using MRCs).			
112. Perform preventive maintenance on antenna couplers/multicouplers (using MRCs).			
113. Perform preventive maintenance on teletypes (using MRCs).			
114. Perform preventive maintenance on switchboards (using MRCs).			
115. Perform preventive maintenance on patch panels (using MRCs).			
116. Perform preventive maintenance on reperforators (using MRCs).			
117. Perform preventive maintenance on paper shredders (using MRCs).			
118. Perform preventive maintenance on copying machines (using MRCs).			
119. Perform preventive maintenance on Optical Character Readers (or OCRs, using MRCs).			
120. Perform preventive maintenance on remote radio telephone operating positions (using MRCs).			
121. Perform preventive maintenance on emergency/portable radio equipment (using MRCs).			

	✓ IF PART OF CURRENT JOB	FREQUENCY On the average, how often do you perform this task? 1 = SELDOM (Less than once/week) 2 = OCCASIONALLY (About once/week) 3 = SOMEWHAT OFTEN (2-6 times/week) 4 = OFTEN (About once/day) 5 = VERY OFTEN (More than once/day)	COMPLICATED TO PERFORM How complicated is this task to perform correctly? 1 = VERY SIMPLE 2 = SIMPLE 3 = SOMEWHAT COMPLICATED 4 = COMPLICATED 5 = VERY COMPLICATED
122. Perform preventive maintenance on automated message reproduction/distribution systems (using MRCs).			
123. Clean and inspect tape heads.			
124. Perform preventive maintenance on telegraph telephone signal converters (using MRCs).			
125. Perform preventive maintenance on radio sets (using MRCs).			
126. Perform preventive maintenance on automated communications systems (using MRCs).			
127. Perform preventive maintenance on audio converters (including audio digital converters; using MRCs).			

APPENDIX B

NAVY RADIOMAN JOB DESCRIPTION QUESTIONNAIRE FOR SUPERVISORS

**NAVY RADIOMAN
JOB DESCRIPTION QUESTIONNAIRE**

(FORM B: To be filled out by supervisors of first-term Radiomen)

Developed by:

Human Resources Research Organization
27857 Berwick Drive
Carmel, CA 93923

and

Personnel Decisions Research Institute
43 Main Street Southeast, Suite 405
Exposition Hall
Minneapolis, MN 55414

INTRODUCTION

The Navy is conducting a project to find the best ways to measure the job performance of first-term Radiomen in the Navy. This questionnaire is an early step in that project. Its purpose is to learn more about the first-term Radioman job from those who know it best--first-term Radiomen and their supervisors.

Please take the time necessary to carefully consider each item and answer it to the best of your knowledge. We appreciate your help.

PRIVACY ACT NOTICE

Under the authority of 5 USC 301 judgments concerning the job performance of first-term Radiomen are requested for a research project on performance assessment. THIS INFORMATION PROVIDED WILL NOT BECOME PART OF YOUR OFFICIAL RECORD, NOR WILL IT BE USED TO MAKE DECISIONS ABOUT YOU WHICH WILL AFFECT YOUR CAREER IN ANY WAY. It will be used by the Navy Personnel Research and Development Center for statistical purposes only. Return of the questionnaire constitutes acknowledgment of these Privacy Act provisions.

This questionnaire has been assigned Report Control Symbol OPHAV 5312-5(OT), which expires 30 June 1985.

GENERAL INFORMATION

Please print your answers in the spaces provided or, where applicable, place a check mark in the one blank that best applies to you.

1. Name: _____

2. Social Security Number: _____

3. Complete Work Mailing Address:

4. What is your current pay grade?

- ☐ E-4
☐ E-5
☐ E-6
☐ E-7
☐ E-8
☐ E-9
☐ Other (please specify: _____)

5. How long have you been in the Navy?

- ☐ Less than 2 years
☐ 2-4 years
☐ 4-8 years
☐ More than 8 years (please specify: _____)

6. For how long have you supervised first-term Radiomen?

- ☐ Have not supervised first-term Radiomen
☐ Less than 3 months
☐ 3 months to 6 months
☐ 6 months to 9 months
☐ 9 months to 1 year
☐ More than 1 year

Go on to the next page

7. What is your current assignment?

- ☐ Ship
- ☐ Shore installation

If your current assignment is on ship, enter the ship type and hull number (e.g., CVN68, FF1083): _____

If your current assignment is on shore, check the type below:

- ☐ General Duty
- ☐ NAVCAMS (also check one of the following:)
 - ☐ Fleet Center
 - ☐ Tech Control Facility (including SATCOM)
 - ☐ Message Center/Data Base/Computer Deck
- ☐ NAVCOMSTA (also check one of the following:)
 - ☐ Fleet Center
 - ☐ Tech Control Facility (including SATCOM)
 - ☐ Message Center/Data Base/Computer Deck
- ☐ Receiver Site
- ☐ Transmitter Site
- ☐ NTCC
- ☐ Other (please specify: _____)

8. How long have you been in your current assignment?

- ☐ Less than 3 months
- ☐ 3 months to 5 months
- ☐ 6 months to 9 months
- ☐ 9 months to 1 year
- ☐ More than 1 year

Go on to the next page.

INFORMATION ABOUT JOB TASKS

This section contains a list of first-term Radioman job tasks. The task list was developed by examining job descriptions, talking with Radiomen and their supervisors, and observing first-term Radiomen on the job. This list covers all first-term Radioman jobs at all installations, so it may contain some tasks that the Radiomen you supervise do not perform.

In this section, you will answer three questions about these tasks:

--Is each task performed by the Radiomen you currently supervise?

For each task that is performed by them...

--How important is it for mission success?

--When it is performed, how often is it performed incorrectly?

As you fill in the questionnaire, consider only the work done by your subordinates in your current job assignment. Do not consider work done by those you supervised in previous assignments.

PERFORMED BY THOSE CURRENTLY SUPERVISED Judgment

Read the first task and decide whether it is performed by the first-term Radiomen that you currently supervise. If the task is a part of at least one Radioman's job, place a check mark next to the task in the column labeled "PERFORMED BY THOSE CURRENTLY SUPERVISED". If the task is not a part of the job of anyone you supervise, go on to the next task without placing anything in the PERFORMED BY THOSE CURRENTLY SUPERVISED column.

Go through the entire list of tasks in this way. DO NOT FILL IN ANY OF THE OTHER COLUMNS UNTIL YOU HAVE GONE THROUGH THE ENTIRE LIST AND INDICATED WHICH TASKS ARE PERFORMED BY THOSE YOU CURRENTLY SUPERVISE.

Example

On the next page is an example of how one supervisor indicated which of three sample tasks are performed by the first-term Radiomen he/she currently supervises.

	<p>✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p><u>IMPORTANCE</u></p> <p>If this task were performed incorrectly or poorly, what effect would there be on the mission?</p> <p>1 - LITTLE OR NO NEGATIVE EFFECT 2 - MINOR NEGATIVE EFFECT 3 - SOME NEGATIVE EFFECT 4 - MAJOR NEGATIVE EFFECT 5 - CATASTROPHIC NEGATIVE EFFECT</p>	<p><u>PERFORMANCE ERRORS</u></p> <p>When this task is performed, how often is it performed (incorrectly)?</p> <p>1 - SELDOM (5% or less) 2 - OCCASIONALLY (20-40%) 3 - SOMEWHAT OFTEN (40-60%) 4 - OFTEN (60-80%) 5 - VERY OFTEN (80% or more)</p>
1. Encode/decode call signs.	✓		
2. Rig emergency antennas.			
3. Slot messages.	✓		

This supervisor went through all the tasks and indicated which ones are performed by the first-term Radiomen he/she currently supervises. Because tasks A and C are performed, a check mark was placed by each of those tasks in the PERFORMED BY THOSE CURRENTLY SUPERVISED column. Task B, "Rig emergency antennas," is not part of the job of any first-term Radioman this person supervises, so he/she did not place a check mark in the PERFORMED BY THOSE CURRENTLY SUPERVISED column by Task B.

This supervisor correctly made the PERFORMED BY THOSE CURRENTLY SUPERVISED judgment for all the tasks on the list before going on to make any other ratings.

IMPORTANCE and PERFORMANCE ERRORS Ratings

When you have finished indicating which tasks are done by the first-term Radiomen you currently supervise, go back to the beginning of the task list and complete the IMPORTANCE and PERFORMANCE ERRORS ratings only for those tasks that you previously indicated to be PERFORMED BY THOSE CURRENTLY SUPERVISED.

The IMPORTANCE and PERFORMANCE ERRORS ratings are to be made by filling in the one appropriate rating for each. A different rating scale is used for each of these ratings.

IMPORTANCE Rating

For the IMPORTANCE rating, indicate how important the task is for mission success. To do this, use the rating scale on the next page to rate the effect that incorrect or poor performance on the task would have on the mission.

- 1 - LITTLE OR NO NEGATIVE EFFECT
- 2 - MINOR NEGATIVE EFFECT
- 3 - SOME NEGATIVE EFFECT
- 4 - MAJOR NEGATIVE EFFECT
- 5 - MAXIMUM NEGATIVE EFFECT

For each task that you checked as PERFORMED BY THOSE CURRENTLY SUPERVISED, enter the one rating (1 to 5) that best describes the importance of that task for mission success, as gauged by the effect that inadequate performance on the task would have on the mission.

PERFORMANCE ERRORS Rating

For the PERFORMANCE ERRORS rating, indicate how often errors are made by first-term Radiomen performing the task without assistance or direct supervision. Use the rating scale on the next page to make the PERFORMANCE ERRORS rating.

- 1 - SELDOM (Performed Incorrectly 20% or Less Of The Time)
- 2 - OCCASIONALLY (Performed Incorrectly 20-40% Of The Time)
- 3 - SOMEWHAT OFTEN (Performed Incorrectly 40-60% Of The Time)
- 4 - OFTEN (Performed Incorrectly 60-80% Of The Time)
- 5 - VERY OFTEN (Performed Incorrectly 80% or More Of The Time)

For each task that you previously checked as PERFORMED BY THOSE CURRENTLY SUPERVISED, enter the one rating (1 to 5) that best describes how often errors are made by first-term Radiomen performing the task without assistance or direct supervision.

Example

After checking all of the tasks performed by his/her first-term Radioman subordinates, this supervisor made the IMPORTANCE and PERFORMANCE ERRORS ratings only for those tasks that had been checked. The ratings are shown on the next page.

	<p>✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p><u>IMPORTANCE</u></p> <p>If this task were performed incorrectly or poorly, what effect would there be on the mission?</p> <p>1 = LITTLE OR NO NEGATIVE EFFECT 2 = MODERATE NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT</p>	<p><u>PERFORMANCE ERRORS</u></p> <p>When this task is performed, how often is it performed incorrectly?</p> <p>1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)</p>
1. Encode/decode call signs.	✓	5	3
2. Rig emergency antennas.			
3. Slot messages.	✓	3	2

Task A: This supervisor believed that encoding/decoding call signs incorrectly would have a maximum negative effect on mission success. Thus, a "5" was written in for the IMPORTANCE rating. Errors are made somewhat often--about 40-60% of the time-- by first-term Radiomen when they perform this task, so a rating of "3" was assigned for PERFORMANCE ERRORS.

Task B: This task was not checked as PERFORMED BY THOSE CURRENTLY SUPERVISED. Therefore, the supervisor did not fill in the IMPORTANCE and PERFORMANCE ERRORS ratings.

Task C: "Slotting messages" incorrectly was believed to have some negative effect on mission success; thus, an IMPORTANCE rating of "3" was assigned. Errors are made occasionally (about 20-40% of the time) by first-term Radiomen performing this task, so a "2" was written in for PERFORMANCE ERRORS.

Go on to the next page and begin the questionnaire.

	✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED	IMPORTANCE If this task were performed in- correctly or poorly, what effect would there be on the mission? 1 - LITTLE OR NO NEGATIVE EFFECT 2 - MINOR NEGATIVE EFFECT 3 - SOME NEGATIVE EFFECT 4 - MAJOR NEGATIVE EFFECT 5 - MAXIMUM NEGATIVE EFFECT	PERFORMANCE RAR When this task is per- formed often is it per- formed incorrectly? 1 - SELDOM (20% or less) 2 - OCCASIONALLY (20-40%) 3 - SOMEWHAT OFTEN (40-60%) 4 - OFTEN (60-80%) 5 - VERY OFTEN (80% or more)
1. Set up LF transmitters.			
2. Set up HF transmitters.			
3. Set up VHF transmitters.			
4. Set up LF receivers.			
5. Set up HF receivers.			
6. Set up VHF receivers.			
7. Set up UHF transceivers.			
8. Set up VHF transceivers.			
9. Set up satellite transceivers.			
10. Set up the SSR-1 satellite receiver.			
11. Set up antenna couplers/multicouplers.			
12. Set up crypto equipment.			
13. Set up teletypes.			
14. Change paper/ribbons on teletypes and printers.			
15. Patch communications equipment pieces together.			
16. Raise/lower antennas.			
17. Assemble/disassemble antennas.			
18. Plot ship positions for antenna assignments.			
19. Load program tapes in magnetic tape reader.			
20. Load program tapes in paper tape reader.			
21. Perform late starts on crypto equipment.			
22. Check frequencies for usability.			
23. Use chirp sounder to determine frequencies.			

	<p>✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p><u>IMPORTANCE</u></p> <p>If this task were performed incorrectly or poorly, what effect would there be on the mission?</p> <p>1 = LITTLE OR NO NEGATIVE EFFECT 2 = MINOR NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT</p>	<p><u>PERFORMANCE ERRORS</u></p> <p>When this task is performed, how often is it performed incorrectly?</p> <p>1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)</p>
24. This item is for keypunch purposes only. Do not write ratings for this one.			
25. Conduct radio checks (secure/nonsecure).			
26. Conduct quality control tests on transmit frequencies.			
27. Read Journal (or channel) log teletypes to determine system status.			
28. Maintain communications status board.			
29. Pull messages from teletype or printer.			
30. Screen incoming messages for relevance, precedence, security classification, etc.			
31. Operate reperforator.			
32. Maintain listening watch on radiotelephone/voice circuits (e.g., Harbor Common, HICOM) and determine when call sign is received.			
33. Receive radiotelephone/voice circuit messages and transcribe to hard copy.			
34. Log entries in the Radiotelephone Log.			
35. Recognize and properly comply with special message handling procedures ("personal for", limited distribution, high precedence, etc.).			
36. Monitor channel number continuity for message traffic.			
37. Draft broadcast screen requests as appropriate.			
38. Log incoming messages.			
39. Log messages in General Message Log.			
40. Reproduce messages on photocopier and verify copy quality.			

	✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED	IMPORTANCE If this task were performed in- correctly or poorly, what effect would there be on the mission? 1 = LITTLE OR NO NEGATIVE EFFECT 2 = MINOR NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT	PERFORMANCE ERRORS When this task is performed how often is it performed incorrectly? 1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)
41. Use routing guide to determine distribution or routing of incoming messages.			
42. Use Standard Subject Identification Codes (SSIC) Manual to correct the internal distribution of messages on the Video Display Terminal (VDT).			
43. Manually route messages to appropriate destinations (e.g., slot messages, post on read board, etc.).			
44. Verify outgoing rough drafts for completeness, accuracy, format, and releasing signature.			
45. Process DD-1392 Forms (data pattern message release forms).			
46. Log outgoing messages.			
47. Enter OCR Forms into Optical Character Reader (OCR).			
48. Use Video Display Terminal (VDT) to troubleshoot and correct OCR Forms that have been rejected.			
49. Remove OCR Forms from Optical Character Reader (OCR) and record Processing Signal Numbers (PSNs) and times of transmission.			
50. Prioritize outgoing messages according to precedence and time of receipt.			
51. Verify smooth messages with supervisor/releasing officers prior to transmission.			
52. Proofread outgoing messages prior to transmission.			
53. Record time of delivery and service cross on messages.			

	<p>✓ if PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p><u>IMPORTANCE</u></p> <p>If this task were performed in- correctly or poorly, what effect would there be on the mission?</p> <p>1 = LITTLE OR NO NEGATIVE EFFECT 2 = MINOR NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT</p>	<p><u>PERFORMANCE ERRORS</u></p> <p>When this task is performed, how often is it performed incorrectly?</p> <p>1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)</p>
54. Process commercial message traffic (perform word counts, determine costs, accept funds, etc.) and maintain associated files/reports.			
55. Close out/commence all radio circuit logs at change of radio day.			
56. Prepare/transmit ZIC/ZID reports.			
57. Maintain communications center message files.			
58. Maintain general message files.			
59. Maintain broadcast files/logs.			
60. Maintain message magnetic tape files.			
61. Select/use relevant general communications publications, instructions, and directions.			
62. Make corrections to and page check communications publications.			
63. Inventory general communications publications.			
64. Type/format/edit messages on teletype.			
65. Type/format/edit messages on Video Display Terminal (VDT).			
66. Determine appropriate format for outgoing messages.			
67. Type messages using ACP-126 format.			
68. Type messages using ACP-126 Modified format.			
69. Type messages using JAMAP 128 format.			
70. Type messages using ACP-127 (NATO) format.			
71. Type messages using Naval Correspondence (letter, memo) format.			

	<p>✓ If PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p>If this task were performed in- correctly or poorly, what effect would there be on the mission?</p> <p>1 = LITTLE OR NO NEGATIVE EFFECT 2 = MINOR NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT</p>	<p>When this task is performed how often is it performed incorrectly?</p> <p>1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)</p>
72. Type and format messages for Optical Character Reader (OCR) using typewriter.			
73. Load paper tape messages into Video Display Terminal (VDT) for editing.			
74. Select and change to appropriate mode on VDT (query, router, service, etc.).			
75. Initialize CUDIX links using command teletype or terminal.			
76. Establish/maintain communications on ship-shore, ship-ship, or termination circuits.			
77. Initiate/respond to challenge and reply procedure on radiotelephone circuits.			
78. Initiate transmission authentication procedures.			
79. Establish/maintain communications on task group ORESTES.			
80. Enter commands on VDT to establish VFCT circuit configurations and channelizations.			
81. Coordinate communications using pony loops or order wires.			
82. Operate air preheater controls.			
83. Transmit messages via VDT terminal.			
84. Transmit paper tape messages using high-speed tape reader and command teletype (CUDIX system).			
85. Transmit messages via radioteletype.			
86. Transmit messages via radiotelephone/voice circuit.			
87. Encode/decode radio frequencies, short sentences, and voice call signs using appropriate publications.			

		IMPORTANCE	PERFORMANCE ERRORS
	✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED	if this task were performed in- correctly or poorly, what effect would there be on the mission? 1 - LITTLE OR NO NEGATIVE EFFECT 2 - MINOR NEGATIVE EFFECT 3 - SOME NEGATIVE EFFECT 4 - MAJOR NEGATIVE EFFECT 5 - MAXIMUM NEGATIVE EFFECT	When this task is performed, how often is it performed incorrectly? 1 - SELDOM (20% or less) 2 - OCCASIONALLY (20-40%) 3 - SOMEWHAT OFTEN (40-60%) 4 - OFTEN (60-80%) 5 - VERY OFTEN (80% or more)
88. Receive confidential materials (excluding CMS).			
89. Inventory confidential materials (excluding CMS).			
90. Route confidential materials (excluding CMS) to appropriate personnel.			
91. Store confidential materials (excluding CMS).			
92. Destroy confidential materials (excluding CMS).			
93. Receive secret materials (excluding CMS).			
94. Inventory secret materials (excluding CMS).			
95. Store secret materials (excluding CMS).			
96. Route secret materials (excluding CMS) to appropriate personnel.			
97. Destroy secret materials (excluding CMS).			
98. Receive top secret materials (excluding CMS).			
99. Witness destruction of top secret materials (excluding CMS).			
100. Witness the receipt of CMS materials.			
101. Witness the inventory of CMS materials.			
102. Witness the control of CMS materials.			
103. Witness the storing of CMS materials.			
104. Store CMS materials.			
105. Witness the destruction of CMS materials.			
106. Check message recipients' identification and security clearance to ensure proper classification for level of traffic being picked up.			

	<p>✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p>If this task were performed incorrectly or poorly, what effect would there be on the mission?</p> <p>1 - LITTLE OR NO NEGATIVE EFFECT 2 - MINOR NEGATIVE EFFECT 3 - SOME NEGATIVE EFFECT 4 - MAJOR NEGATIVE EFFECT 5 - MAXIMUM NEGATIVE EFFECT</p>	<p>When this task is performed how often is it performed incorrectly?</p> <p>1 - SELDOM (20% or less) 2 - OCCASIONALLY (20-40%) 3 - SOMEWHAT OFTEN (40-60%) 4 - OFTEN (60-80%) 5 - VERY OFTEN (80% or more)</p>
107. This item is for keypunch purposes only. Do not write ratings for this one.			
108. Perform preventive maintenance on receivers (using Maintenance Record Cards, or MRCs).			
109. Perform preventive maintenance on transceivers (using MRCs).			
110. Perform preventive maintenance on transmitters (using MRCs).			
111. Perform preventive maintenance on antennas (using MRCs).			
112. Perform preventive maintenance on antenna couplers/multicouplers (using MRCs).			
113. Perform preventive maintenance on teletypes (using MRCs).			
114. Perform preventive maintenance on switchboards (using MRCs).			
115. Perform preventive maintenance on patch panels (using MRCs).			
116. Perform preventive maintenance on repeaters (using MRCs).			
117. Perform preventive maintenance on paper shredders (using MRCs).			
118. Perform preventive maintenance on copying machines (using MRCs).			
119. Perform preventive maintenance on Optical Character Readers (or OCRs, using MRCs).			
120. Perform preventive maintenance on remote radio telephone operating positions (using MRCs).			
121. Perform preventive maintenance on emergency/portable radio equipment (using MRCs).			

	<p>✓ IF PERFORMED BY THOSE CURRENTLY SUPERVISED</p>	<p><u>IMPORTANCE</u></p> <p>If this task were performed in- correctly or poorly, what effect would there be on the mission?</p> <p>1 = LITTLE OR NO NEGATIVE EFFECT 2 = MINOR NEGATIVE EFFECT 3 = SOME NEGATIVE EFFECT 4 = MAJOR NEGATIVE EFFECT 5 = MAXIMUM NEGATIVE EFFECT</p>	<p><u>PERFORMANCE ERRORS</u></p> <p>When this task is performed, how often is it performed incorrectly?</p> <p>1 = SELDOM (20% or less) 2 = OCCASIONALLY (20-40%) 3 = SOMEWHAT OFTEN (40-60%) 4 = OFTEN (60-80%) 5 = VERY OFTEN (80% or more)</p>
122. Perform preventive maintenance on automated message reproduction/distribution systems (using MRCs).			
123. Clean and inspect tape heads.			
124. Perform preventive maintenance on telegraph telephone signal converters (using MRCs).			
125. Perform preventive maintenance on radio sets (using MRCs).			
126. Perform preventive maintenance on automated communications systems (using MRCs).			
127. Perform preventive maintenance on audio converters (including audio digital converters; using MRCs).			

APPENDIX C
CRITICAL TASK SELECTION STEPS FOR CATEGORY I

CRITICAL TASK SELECTION STEPS FOR CATEGORY 1

1. Select the eight tasks from the category with the highest overall mean criticality values.
2. Replace¹ these tasks if they fall below the overall mean frequency value for the category.
3. Replace tasks if the percentage performing (incumbents) or the percentage supervising (supervisors) is less than 50 percent.
4. Replace tasks if the frequency mean or the importance mean in any of the sampling cells falls below -1 standard deviation for that mean for the tasks in the category.
5. Replace tasks if the percentage performing or percentage supervising falls below 40 in any sampling cell.
6. Replace tasks if the mean for performance errors falls below the mean for the category or if the mean for complicated to perform falls below -1 standard deviation for the category means.

¹ Replacements were always drawn in order from the list of tasks ranked by overall criticality mean, and were drawn where possible to meet all decision criteria prior to the current one. For example, in Step 3, the next unselected task from the rank ordering on the basis of criticality mean would be selected if its frequency mean did not fall below the overall frequency mean for the category (Step 2).

APPENDIX D
FINAL SELECTED CRITICAL TASKS

FINAL SELECTED CRITICAL TASKS

1. Set up crypto equipment.
2. Set up teletypes.
3. Change paper/ribbons on teletypes and printers.
4. Patch communications equipment pieces together.
5. Type/format/edit messages on teletype.
6. Select/use relevant general communications publications, instructions, and directions.
7. Inventory confidential materials (excluding CMS).
8. Inventory secret materials (excluding CMS.)
9. Destroy secret materials (excluding CMS).
10. Screen incoming messages for correct address, precedence, security classification, etc.
11. Recognize and properly comply with special message handling procedures ("personal for," limited distribution, high precedence, etc.).
12. Monitor channel number continuity for message traffic.
13. Use routing guide to determine distribution or routing of incoming messages.
14. Manually route messages to appropriate destinations (e.g., slot messages, post on read board, etc.).
15. Verify outgoing messages on DD-173 for completeness, accuracy, format, and releasing signature.
16. Prioritize outgoing messages according to precedence and time of receipt.
17. Proofread outgoing messages prior to transmission.
18. Maintain communications center message files.
19. Route classified messages (excluding CMS) to appropriate personnel.
20. Receive classified message traffic (excluding CMS).
21. Perform preventive maintenance on receivers (using MRCs).
22. Perform preventive maintenance on transmitters (using MRCs).